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**Networking Capabilities
for the Missile Research, Development and Engineering Center (MRDEC)**

(5-20257 & 5-20258)

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PREFACE

This technical report was prepared by the staff of the Research Institute, The University of Alabama in Huntsville. The purpose of this report is to provide documentation of the work performed and results obtained under Delivery Order 20 of AMCOM Contract No. DAAH01-98-D-R001. Mr. James R. Clark was the principal investigator. Mr. Doug Eskew and Mr. Alan Schuld provided significant technical support and networking analysis. Mr. Gary Bobo, Systems Simulation and Development Directorate, Research, Development and Engineering Center, provided technical guidance.

The views, opinions, and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision unless so designated by other official documentation.

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Prepared for: Commander
U.S. Army Missile Command
Redstone Arsenal, AL 35898

I have reviewed this report, dated January 2000 and the report contains no classified information.

James R. Clark
Principal Investigator

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1.0 Introduction

The Systems Simulation and Development Directorate has the responsibility for coordinating the research, development, and management of Local Area Networks (LANs) activities within the Missile Research, Development and Engineering Center. Directorates and offices within MRDEC require local computer networks with other LANs and Wide Area Networks (WANs). Networking is essential to evaluate missile computer systems and allow MRDEC access to technology at other DoD sites and worldwide. In support of this effort, UAH was contracted to perform research and analysis of computer networking capabilities within the MRDEC. UAH provided to the Center capabilities for LANs and WANs for missile systems and advanced missile manufacturing.

2.0 Objective

To meet the networking challenge the Systems Simulation and Development Directorate required research and analysis of advanced computer networking capabilities currently employed by the Redstone Community. The objective of this task was to research, design and implement where necessary enhancements to the MRDEC LAN so that it was fully integrated with other MRDEC/Project Office/contractor computer technologies.

3.0 Statement of Work

The statement of work, as outlined in delivery order 20, was as follows:

- 3.1 UAH shall provide research and development of local and wide area networks for the support of missile systems within the MRDEC community. UAH shall install RJ-45 Level 5 unshielded twisted pair cable drops whenever required to ensure connectivity to MRDEC LAN. All required cable drops shall be run back to a central punchdown block, which shall be connected to a patch pan via Telco 50-pin type cables. UAH shall provide plans and drawings of all network connections in the Center and ensure all networks meet the MRDEC standard requirements in linking to the MRDEC FDDI main network.
- 3.2 UAH shall be responsible for physically linking (via a 12 or 24 fiber pair link) and logically linking all network hubs servicing building 5400 to the MRDEC enterprise hub that serves as the MRDEC central control of the entire MRDEC network. UAH shall be responsible for the proper installation and configuration of the networking hubs and support equipment so that the physical and logical networking existing in building 5400 shall be effectively installed for full network functionality. UAH shall completely document the wiring diagram of all network drops including room, cable numbers, IP addresses, and networking hub configurations.

- 3.3 UAH shall provide network engineering support to MRDEC to ensure continued capabilities for the local area networks. This support shall include software/hardware upgrades to the networking hubs, servers, and clients to ensure that the MRDEC network will remain operational at the highest performance level possible. UAH shall ensure network connectivity to all Directorates and Offices in building 5400.
- 3.4 UAH shall deliver to the government all data resulting from performance of the above efforts. This data shall be incorporated into reports IAW DI-ADMN-80447 and DI-FNCL-80912 of the DD 1423 in the basic contract and deliver as defined below. One copy of DI-FNCL-80912 shall be distributed to AMSAM-RD-SS-SP NLT the 15th of each month starting on the second month of the effort and continuing through effort completion. One copy of DI-ADMN-80447 shall be distributed to AMSAM-RD-SS-SP at the completion of the delivery order.

4.0 Conclusion and Recommendations

During the time frame allocated by the delivery order, members of the UAH Systems Management and Production Lab, with the cooperation of representatives from AMCOM Systems Simulation and Development Directorate and MRDEC, performed an analysis of information and networking technologies to support the MRDEC efforts. This analysis led to the design and implementation of the MRDEC LAN Support Strategy. All efforts for the LAN strategy were documented and delivered to Systems Simulation and Development Directorate under separate cover.

The investigation of information and networking technologies included the analysis of current MRDEC data sharing requirements. It is recommended that these requirements be revisited periodically to determine the required LAN infrastructure. As the MRDEC requires additional capacity and as networking technologies become more advanced, the MRDEC LAN should be enhanced to exploit newly developed technologies.